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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,038	09/22/2003	Akinori Furuya	034620-105	1798

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EXAMINER

BERNATZ, KEVIN M

ART UNIT PAPER NUMBER

1773

DATE MAILED: 09/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/669,038

Applicant(s)

FURUYA ET AL.

Examiner

Kevin M. Bernatz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 19-30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/5/05.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Response to Amendment

1. Amendments to claim 19, filed on July 5, 2005, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Request for Continued Examination

3. The Request for Continued Examination (RCE) under 37 CFR 1.53 (d) filed on July 5, 2005 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Rejections - 35 USC § 102

4. Claims 19 – 24 and 27 – 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Machida (U.S. Patent No. 4,883,710).

Regarding claim 19, Machida discloses a magneto-optical (MO) recording medium having a recording layer (*Figure 4, element 13*) and a reflective layer (*element 21*) on a substrate (*element 11*), the recording layer comprising a first magnetic layer (i.e. applicants' "garnet ferrite layer") (*element 17 and col. 4, lines 34 – 65*) and at least one second magnetic layer (i.e. applicants' "underlayer") (*element 15*) selected from a material meeting applicants' claimed Markush limitations (*col. 4, lines 34 – 65*), wherein

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the underlayer is formed on the substrate or the reflective layer (*Figure 4*), the garnet ferrite layer is formed adjacent to the underlayer after the formation of the underlayer (*Figure 4 and col. 11, line 66 bridging col. 12, line 3*).

Regarding the limitation(s) "the recording layer is heat-treated after the formation of the garnet ferrite layer at a temperature of 500 to 700°C, thereby reducing the internal compressive stress of the garnet ferrite layer by the tensile stress provided from the underlayer", the Examiner notes that this limitation(s) are/(is a) process limitation(s) and is/are not further limiting in terms of the structure resulting from the claimed process. Specifically, in a product claim, as long as the prior art product meets the claimed structural limitations, the method by which the product is formed is not germane to the determination of patentability of the product unless an unobvious difference can be shown to result from the claimed process limitations. In the instant case, the Examiner notes that the disclosed product meets all the claimed structural limitations as recited above and is formed on heated substrates (*col. 14, lines 41 – 60, wherein the first magnetic layer is deposited at a temperature of 550 °C*) and, furthermore, the combined recording layer structure is reported to exhibit an increased Faraday rotation angle (*col. 7, lines 20 – 30*), which is similar to the improved performance reported by applicants. As such, the Examiner deems that the prior art products are substantially identical in structure to applicants' product, even though the prior art products are not produced with the claimed process limitations.

Regarding claims 20 and 27, Machida discloses tracks and grooves meeting applicants' claimed structural limitations (*Figure 10; col. 11, lines 40 – 51; and col. 12, lines 10 – 15*).

Regarding claims 21 and 22, Machida discloses reflecting layer meeting applicants' claimed structural limitations (*element 21 in Figures 4 and 5*).

Regarding claims 23 and 24, Machida discloses thickness values coextensive with applicants' claimed numerical ranges (*col. 6, lines 6 – 9; col. 8, lines 32 – 35; and col. 10, lines 21 – 25*).

Regarding claim 28, Machida discloses "loads" meeting applicants' claimed structural limitations (*Figures 7 and 10 and col. 11, lines 40 – 43*).

Regarding claims 29 and 30, Machida discloses heat insulating layers (i.e. applicants' "transparent layers") (*Figures – element 19; col. 11, lines 1 - 21*) meeting applicants' claimed structural limitations. While Machida does not explicitly disclose that the layer is transparent, the Examiner notes that the recited dielectric materials are known to be transparent and Machida implicitly states that they are transparent by noting that the laser beam can be applied to the substrate side if a *transparent* substrate is used (*col. 11, lines 11 – 16*) or the heat insulating layer side. I.e. the heat insulating layer must be transparent to allow the laser to be applied from that direction.

Claim Rejections - 35 USC § 103

5. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machida as applied above, and further in view of Licht (U.S. Patent No. 5,146,361).

Machida is relied upon as described above.

Machida fails to disclose a laminate comprising a plurality of recording and underlayers meeting applicants' claimed structural limitations, though the Examiner notes that Machida teaches thickness values meeting applicants' claimed limitations for both the individual garnet ferrite layers and the combined garnet ferrite + underlayer structures (*col. 6, lines 6 – 10; col. 8, lines 32 – 35; col. 10, lines 21 – 25; and Examples*).

However, Licht teaches that when forming thick garnet ferrite layers in magneto-optical applications, cracking and thermal stresses can be avoided by using a laminated structure comprising alternating magneto-optic layers wherein the relative expansion coefficients are controlled to be similar to the adjacent layers (*col. 1, lines 23 – 58; col. 3, lines 12 – 23 and Figures*). While Licht utilizes alternating garnet-garnet layers, the Examiner deems that one of ordinary skill in the art would readily recognize the benefits could be achieved using the Machida garnet-spinel ferrite structures.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Machida to use alternating thin layers of garnet and spinel ferrite as taught by Licht since such a structure allows the formation of thick magneto-optic layers with reduced occurrence of cracking and thermal stresses.

6. Claims 19 – 24 and 27 – 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machida as applied above, and further in view of Furuya et al. (J. Mag. Mat., 193, March 1999, 143 – 147).

Machida is relied upon as described above.

While the Examiner deems that the product disclosed by Machida is substantially identical in structure to the claimed product, the Examiner notes that Machida does not explicitly teach processing the recording medium as claimed by applicants.

However, Furuya et al. teach a MO recording medium wherein a spinel-ferrite layer is explicitly taught to be deposited under a garnet ferrite recording layer, then both layers are heat treated at a sufficient temperature (700 °C) to insure the formation of a polycrystalline layer having improved Faraday rotation and other magneto-optical characteristics (*entire disclosure*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Machida to utilize the claimed process limitations as taught by Furuya et al., since such a process results in a polycrystalline layer possessing improved Faraday rotation and other magneto-optical characteristics.

7. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machida in view of Furuya et al. as applied above, and further in view of Licht ('361).

Machida and Furuya et al. are relied upon as described above.

Neither of the above disclose a laminate comprising a plurality of recording and underlayers meeting applicants' claimed structural limitations, though the Examiner notes that Machida teaches thickness values meeting applicants' claimed limitations for

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both the individual garnet ferrite layers and the combined garnet ferrite + underlayer structures (*col. 6, lines 6 – 10; col. 8, lines 32 – 35; col. 10, lines 21 – 25; and Examples*).

However, Licht teaches that when forming thick garnet ferrite layers in magneto-optical applications, cracking and thermal stresses can be avoided by using a laminated structure comprising alternating magneto-optic layers wherein the relative expansion coefficients are controlled to be similar to the adjacent layers (*col. 1, lines 23 – 58; col. 3, lines 12 – 23 and Figures*). While Licht utilizes alternating garnet-garnet layers, the Examiner deems that one of ordinary skill in the art would readily recognize the benefits could be achieved using the Machida garnet-spinel ferrite structures.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Machida in view of Furuya et al. to use alternating thin layers of garnet and spinel ferrite as taught by Licht since such a structure allows the formation of thick magneto-optic layers with reduced occurrence of cracking and thermal stresses.

Response to Arguments

8. The rejection of claim 26 under 35 U.S.C § 112 – 2nd Paragraph

The above noted rejection has been withdrawn because applicant(s) amendment(s) have set forth new limitations no longer indefinite under the guidelines of 35 U.S.C. § 112 2nd Paragraph.

**9. The rejection of claims 19 - 27 under 35 U.S.C § 102(b) and/or 103(a) –
Machida, alone or in view of Licht et al.**

Applicant(s) argue(s) that the claimed process “imparts a distinctive structural characteristic to the final product” and that “the structure of the claimed invention is different since the final product can only be defined by the process utilized in the claimed invention and not in the prior art reference”. The examiner respectfully disagrees.

First, the Examiner notes that applicants point to Figure 1(a) and 1(b) of Furuya et al. and argue that “if no underlayer is used ... 5 minutes of heat treatment cannot cause crystallization”, which is not true. Furuya et al. explicitly states that “after the 5 min annealing, the layer remained amorphous at temperatures below 650°C and crystallization began at temperatures above 650°C” (*Experiment section*). Furthermore, the comparison isn’t whether an underlayer is used or not, the comparison must be made against the closest prior art, in this case the process disclosed by Machida. Machida teach depositing the first magnetic layer (which can comprise the garnet ferrite layer claimed by applicants) at substrate temperatures of 550 °C (*Example 1*), and further reports that an increase in the Faraday rotation is seen when the dual/bi-layered structure is utilized. The Examiner notes that Furuya et al. reports *exactly* the same improvement in the Faraday rotation as being a result of the post deposition annealing (*Results and Discussion section*). Since both Furuya et al. (*which is made by utilizing the claimed process*) and Machida (*which is made by a different process*) report the same improvement in the same property (*i.e. an increase in the Faraday rotation*), the

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Examiner deems that there is sound basis that the structure of two bi-layered MO recording media are substantially identical.

Regarding applicants' arguments directed to the substrate temperature and "the formation of the first and second magnetic layers of Machida requires much more time due to the high temperature of the substrate", the Examiner notes that (a) the substrate deposition temperature is not claimed (and if it was, it would still be a process limitation in a product claim, as above), and (b) the time to form the product is not germane to the patentability of a product.

Regarding applicants' argument that "by the heat treatment after the formation of the underlayer and the garnet ferrite (recording) layer Providing magneto-optical recording abilities to the garnet ferrite (recording) layer 3a only on the underlayer 2 while making the garnet ferrite layer 3b which is not formed on the underlayer 2 non-magnetic as shown in Fig. 18A and 18B", the Examiner notes that the specification is not the measure of the invention. Therefore, limitations contained therein can not be read into the claims for the purpose of avoiding prior art. *In re Sporck*, 55 CCPA 743, 386 F.2d 924, 155 USPQ 687 (1968).

Conclusion

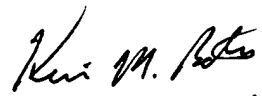
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
August 31, 2005


Kevin M. Bernatz, PhD
Primary Examiner